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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/967,187	09/28/2001	Gregory E. Howard	TI-29894	5978

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EXAMINER

SOWARD, IDA M

ART UNIT	PAPER NUMBER
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2822

DATE MAILED: 07/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/967,187

Applicant(s)

HOWARD ET AL.

Examiner

Ida M Soward

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 May 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

This Office Action is in response to Applicants' amendment filed May 9, 2003.

### *Specification*

The objection to the title has been withdrawn due to the amendment filed.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Momose (5,198,692) in view of Hebert et al. (5,439,833).

Momose teaches a bipolar junction transistor, comprising: a buried collector layer **2**; a collector region **3** adjacent to the buried collector layer; a base region **4** adjacent to the collector region; and an emitter region **5** adjacent to the base region (Figures 1A-1C). However, Momose fails to teach a counterdoped collector region. Hebert et al. teach a counterdoped collector region **12** (Figures 1-10, col. 6, lines 25-32). Since Momose and Hebert et al. are both from the same field of endeavor (bipolar junction transistors), the purpose disclosed by Hebert et al. would have been recognized in the pertinent art of Momose. Therefore, it would have been obvious to

one having ordinary skill in the art at the time the invention was made to modify the BJT structure of Momose with the BJT having a counterdoped collector region of Hebert et al. to provide a device that has applicability in high frequency communication circuits (col. 1, lines 10-16).

Claims 2, 4-6 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momose (5,198,692) and Hebert et al. (5,439,833) in view of Kabir et al. (US 6,346,452 B1).

Momose and Hebert et al. teaches all mentioned in the rejection above. However, Momose and Hebert et al. fails to teach at least one of the dopant species in the collector region having a dopant concentration greater than  $0.5 \times 10^{17} \text{cm}^{-3}$ , a SiGe base, and types of scattering centers. Kabir et al. teach that at least part of the collector region has a doping concentration of  $2 \times 10^{17} \text{cm}^{-3}$ , a SiGe base (col. 5, lines 7-14) and neutral phosphorus scattering centers (cols. 2-3, lines 66-67 & 1-42, respectively). Since Momose, Hebert et al. and Kabir et al. are from the same field of endeavor (bipolar junction transistors), the purpose disclosed by Kabir et al. would have been recognized in the pertinent art of Momose and Hebert et al. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the BJT structure of Momose, the BJT having a counterdoped collector region of Hebert et al. and by incorporating the collector doping concentration, SiGe base and phosphorus scattering centers of Kabir et al. to increase the frequency performance of bipolar transistors.

Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Momose (5,198,692), Hebert et al. (5,439,833) and Kabir et al. (US 6,346,452 B1) as applied to claims 1 and 5 above, and further in view of Prior Art Figure 1.

Momose, Hebert et al. and Kabir et al. teach all mention in the rejections above. However, Momose, Hebert et al. and Kabir et al. fail to teach a distance from the edge of the buried collector region to the edge of the base region, which is adjacent to the collector region as claimed in the present invention. Prior Art Figure 1 teaches the same buried collector edge to base region edge distance **70** as the distance **90** of the claimed embodiment of Figure 2. Since Momose, Hebert et al., Kabir et al. and Prior Art Figure 1 are from the same field of endeavor (bipolar junction transistors), the purpose disclosed by Prior Art Figure 1 would have been recognized in the pertinent art of Momose, Hebert et al. and Kabir et al. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the BJT structure of Momose, the BJT having a counterdoped collector region of Hebert et al. and the collector doping concentration, SiGe base and phosphorus scattering centers of Kabir et al. with the buried collector edge to base region edge distance of Prior Art Figure 1 to achieve optimal device operation.

### ***Response to Arguments***

Applicant's arguments filed 05-09-03 have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine

the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Herbert et al. disclose a base implant in the collector region being counterdoped by a highly-doped collector. Combining the counterdoped collector of Herbert et al. with the bipolar structure of Momose to minimize base parasitic capacitance.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ida M Soward whose telephone number is 703-305-3308. The examiner can normally be reached on Monday - Thursday, 6:30 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9319 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ims  
July 23, 2003

  
AMIR ZARABIAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800